DOCUMENT RESUME

ED 135 469 PS 009 098

AUTHOR Guinagh, Barry J.; Gordon, Ira J.
TITLE School Performance as a Function of Early Stimulation. Final Report.
INSTITUTION Florida Univ., Gainesville. Inst. for Development of Human Resources.
SPONS AGENCY Office of Child Development (DHEW), Washington, D.C.
PUB DATE Dec 76
GRANT NIH-HEW-OCD-09-C-638
NOTE 79p.

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS *Academic Achievement; Achievement Tests; Disadvantaged Youth; *Early Childhood Education; *Early Experience; Elementary Education; Home Visits; Intelligence; *Intervention; *Longitudinal Studies; Mothers; Parent Child Relationship; *Parent Education; Parent Participation; Program Effectiveness; Rating Scales; Special Education; Teacher Attitudes

ABSTRACT

The purpose of this study, a longitudinal extension of a series of early interventions by means of parent education projects, was to determine if there were lasting effects on school performance and home-school relations. School records of 91 elementary school students through grade 4 who had been involved for 1, 2 or 3 consecutive years in the original intervention were examined. Their present elementary teachers filled out rating forms on classroom involvement and their perception of parental involvement. Significant differences in favor of the treatment groups were found. Fewer were assigned to special education programs in general and EMR and TMR classes in particular. There were significant differences in favor of the longitudinal group performance on the MAT, SAL and CTBS in second, third or fourth grade. There were no significant differences in teacher ratings. The results indicate that there were clear lasting school achievement and performance effects for children who were in the original program for 2 or 3 years and the effect lasted up to 6 years. (Author/MS)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED135469

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SCHOOL PERFORMANCE AS A FUNCTION OF EARLY STIMULATION

Barry J. Guinagh[1]
Principal Investigator

Ira J. Gordon[2]
Graduate Research Professor

Institute for Development of Human Resources
College of Education
University of Florida
Gainesville, Florida 32611

December 1976

Final Report

to

Office of Child Development

Grant No. NIH-HEW-OCD-09-C-638

PS 009098

[1]Barry J. Guinagh is an Associate Professor, Foundations of Education and member of IDHR.

[2]Ira J. Gordon is a Graduate Research Professor, Foundations of Education and Director of IDHR.

Acknowledgement

We wish to acknowledge the parents and children who participated in this project, and stayed with it over the years. Thanks are due to the Alachua, Bradford, Columbia, Clay, Dixie, Gilchrist, Levy, Marion, Putnam and Union County Public Schools for their cooperation in making pupil records available. The data were processed at the Northeast Florida Regional Computing Center facilities. We wish to thank Drs. Linda M. Crocker, Robert S. Soar and William B. Ware for their suggestions on data analysis. Finally, thanks are due to Barbara Nixon of the Institute for Development of Human Resources for her efforts in the preparation of this report.

TABLE OF CONTENTS

		Page
Chapter 1	Problem	1
	Related Research	2
	The Present Study	9
Chapter 2	Procedure	11
	Sample	11
	Original Treatment	11
	Present Sample	11
	Attrition	12
	Instruments	13
	Measures on Children	13
	Measures on Parents	15
Chapter 3	Results	17
	Summary of Results	44
Chapter 4	Discussion	46
	Longitudinal Effects	46
	Implications for Service	50
	Implications for Research	52
	Conclusions	55
Chapter 5	Executive Summary	56
References		60
Appendix A	Means and Standard Deviations on Four Measures Given at Age 6 by Number of Years and Timing of Participation in the Stimulation Program (N=176)	63
Appendix B	IQ Scores for Those Not Assigned to Special Education	64

TABLE OF FIGURES

		Page
Figure 1	Percent of Children Scoring 2.0+, 3.0+, and 4.0+ on MAT, Spring, 1976, When in Grades 2, 3 and 4.....	21

TABLE OF TABLES

Table		Page
1	Longitudinal Study - Treatment Design Child's Age by Months.....	7
2	Means and Standard Deviations on Stanford-Binet at ages 3, 4, 5 and 6 and Bayley at age 2 by Number of Years and Timing of Participation in the Stimulation Program.....	8
3	IQ Means at Ages 2, 3, and 6 for Original Group and Present Sample.....	14
4	Percentages of Children Above Grade Level (2.9, 3.9 or 4.9) in 2nd, 3rd, or 4th Grade on MAT, or CTB.....	18
5	Number of Children Within School Year of Grade Level in 2nd, 3rd, and 4th Grade in Spring, 1976 (2.0+, 3.0+, and 4.0+).....	20
6	Number of Children in Third Grade Assigned to Regular or to Special Education (Educable Mentally Retarded, Trainable Mentally Retarded, Specific Learning Disability or Emotionally Disturbed) by Treatment.....	22
7	Number of Children in Third Grade Assigned to Regular or to Special Education Classes (Educable Mentally Retarded, Trainable Mentally Retarded, Specific Learning Disability, Emotionally Disturbed) by Combined Treatment and Control Groups.....	24
8	Number of Children in Third Grade Assigned to Educable Mentally Retarded or Trainable Mentally Retarded by Combined Treatment and Control Groups.....	25
9	Number of Children Assigned to Special Education, Years Assigned and Type of Assignment.....	26
10	IQ Scores for Those Assigned to Special Education (EMR, TMR, SLD, SH, ED, G).....	27
11	Number of Children With Various Problems.....	29
12	Item Scores by Group for Classroom Behavior Inventory..	31

TABLE OF TABLES - Continued

Table		Page
13	Means and Standard Deviation for Factor Scores for Classroom Behavior Inventory.....	33
14	Teacher Report of Parent Behavior Items.....	35
15	Means and Standard Deviations for Teacher Report of Parent Behavior Items.....	39

Chapter 1: Problem

Are there lasting effects, into the school years, of an early child stimulation through parent education program for children from three months to three years of age? Children and parents from such a program had been fo owed to age six (Gordon and Guinagh, 1974), but the critical question of effects beyond that point, after children enter school, remains. The issue is of both scientific and social importance (Bronfenbrenner, 1974). It is of national significance as states move toward the creation and implementation of organized early childhood education programs which emphasize parent education and parent involvement. If there is a lasting effect into the school years, then the program developed at the Institute for Development of Human Resources, University of Florida, offers a possible model for application.

Research has demonstrated that the influence of the home seems more critical than the quality of education the child receives at school in affecting school achievement (Coleman, 1966; Jencks et al., 1972; Mosteller, and Moynihan, 1972; Mayeske et al., 1973). "The association of achievement with family background...shows that about 85 percent of the variation in average achievement between schools is associated with measures of the family background of children attending the schools (Mayeske et al., 1973. O. IV)." Therefore, while the surest route to the American dream is through the schools, the most important element in a child's success in school remains in the child's family. The Florida Parent Education Program specifically focused on the family so that the support system for the child's intellectual growth might endure in the family. The program has

succeeded as the child entered school at age six. However, it is important to determine if the program has an influence on the child and family which is still present in the early grades of school. Therefore, the research strategy is an ecological investigation of actual school performance and home-school relations. The objective of this study is to see if the effectiveness of the program demonstrated at age six is maintained in the children's achievement in the schools.

Related Research

Bronfenbrenner (1974) stated that Parent-Child Intervention programs, such as the Florida Parent Education Program, have the greatest success in terms of long-range results. However, few studies have followed children into the public school after a parent education program. In a summary statement Bronfenbrenner (1974, p. 53) concludes:

> Parent-Child intervention resulted in substantial gains in IQ which were still evident three to four years after termination of the program (Gordon 1972, 1973; Levenstein 1972a). In none of the follow-up studies, however, had the children yet gone beyond the first grade.

Reviews by Goodson and Hess (1975) and Gordon et al. (1975) also echo the lack of longitudinal assessment in most parent education efforts. Many of the efforts were not designed to test long-range effects, or began too recently for such effects to be assessed.

However, some research has demonstrated the success of a parent education approach. Phyllis Levenstein's (1971) program used non-professional women called "Toy Demonstrators" who visited the homes for semiweekly, half-hour home visits. Karnes, Teska, Hodgins and Badger (1970) report posttest IQ scores 16 points above a matched

control group. The treatment consisted of a weekly 2-hour meeting held over a 15-month period where mothers were instructed in teaching techniques to be used with their child at home. No follow-up on the children to determine the stability of these scores is available.

Those projects that have followed children into school have had equivocal results. For example, the Perry Preschool Project at Ypsilanti, Michigan, (Weikart et al., 1970) found that children in a preschool program may lose their superiority in IQ test performance in comparison to children from a similar background, but may gain ground with respect to the national norm. Other studies have not found this relative gain in IQ scores, but have found that the differences between the control and experimental groups have been maintained. In the Early Training Project at the Demonstration and Research Center for Early Education (Gray and Klaus, 1970), differences between experimentals and controls on the Stanford-Binet IQ were still significant at the end of the third year after; however when intervention ceased, both groups show a decline in IQ after the first grade, but the declines tend to be relatively parallel.

The Florida Parent Education Program differs from the work of Gray and Klaus and from Weikart in three significant ways: (1) The project began when the children were much younger, in our case at three months while the above programs began at three years of age. Bronfenbrenner's review finds early intervention important: "The magnitude of IQ gain was inversely related to the age at which the child entered the program, the greatest gains being made by children enrolled as one and two year olds (Bronfenbrenner, 1974, p. 53)."

(2) The above programs were equally focused on a child-centered program as well as the parent education program. In the Florida Parent Education Program, the focus was always on parent education. When the children turned two, the children did have a group experience for two hours a day, two days a week, for one year, but the focus still remained on the parent. Bronfenbrenner's (1974) review of early intervention notes the importance of focusing on the parent as the primary teacher of her child:

> "Gains from parent intervention during the preschool years were reduced to the extent that primary responsibility for the child's development was assumed by the staff member rather than left with the parent, particularly when the child was simultaneously enrolled in a group intervention program (Gilmer et al., 1970, Karnes et al., 1969c)." (Bronfenbrenner, 1974, p. 53).

(3) At the end of the project, the children in the above programs went directly to school. In the Florida Parent Education Program, the children were too young to go to school and only a few have been in a variety of organized group settings, most of which have not had an educational focus.

The Florida work differed from Levenstein in our use of paraprofessionals, in beginning at three months rather than two years, in our use of non-commercial materials, and in a schedule of once-a-week visits for the entire time of participation.

Background of Florida Parent Education Project. The Florida Parent Education Project began work with mothers of children of 3 months of age in September, 1966. The sample consisted of 150 experimental and about 60 control families in 12 counties in northern Florida. Families were randomly assigned to control and experimental

groups. The families were classified as below the poverty level by the local hospital where the children were born. Eighty percent of the families were Black and 20 percent were white. The intervention consisted of home visits by paraprofessional parent educators who demonstrated specifically designed home learning activities to the parent once a week so that the parent in turn would engage in instructional interaction with her child. Each parent educator worked with approximately ten families. The initial year of the parent education program was an engineering effort to develop a delivery system and create a set of materials for the parent to teach the child (Gordon, 1967).

In the second year of the program, half the original experimental group was randomly assigned as a new control group. The third year of the project, half of the children in each group were randomly assigned to the experimental and half to a control group. New families were also recruited. All of the intervention had been of a home visit nature, on roughly a once-a-week schedule (Gordon, 1969).

When the children turned two, a group experience was added to the home visitation program. The children were placed in what were called home learning centers, or backyard centers, five children at a time, for four hours a week in two 2-hour periods. These were homes of mothers in the project and were a mixture of urban homes in a housing project in the Gainesville area and rural homes around the 12-county area. In some of the Gainesville situations, these were homes newly opened in housing projects. The mother who lived in the home was employed as an aide to the backyard center director who was

the parent educator. Each parent educator still worked with ten mothers and ten children; she met groups in the center while continuing to meet with the mothers on a once-a-week basis. New two-year-olds who had not been in the study were added so that the effect of starting the program at age two could be assessed. This created seven treatment groups as shown on Table 1 (Gordon and Guinagh 1969-1974).

Although the intervention program ended when the children were three, assessment of the children and the parents on the child's fourth, fifth, and sixth birthday continued. The last of the children turned six years of age in November, 1973.

Results of the Longitudinal Study Through Age Six. To understand the results at age six, it must be remembered that all phases of the intervention were completed three years previously. Some of the children have been out of the program for as long as five years. Results at age six showed that children in the experimental group for all three years or for two consecutive years were superior to the control group on the Stanford-Binet. [See Appendix A (Gordon and Guinagh, 1974, p. 27)]. These differences were evident at least three years after the termination of the project. The longitudinal trend in the IQ scores can be seen in Table 2. There were differences, and the differences did not fade as is the case in many preschool programs after the programs terminate. The differences are in the neighborhood of 7 or 8 IQ points.

Other results at age six indicated that the families have been affected by the Florida Parent Education Program. Interviews were

Table 1

Longitudinal Study - Treatment Design
Child's Age by Months

Group	3-12	12-24	24-36	48, 60, 72
1. all 3 years	Home Visit	Home Visit	Home Learning Center/Home Visit	Test
2. first 2	Home Visit	Home Visit	Control	Test
3. second 2	Control	Home Visit	Home Learning Center/Home Visit	Test
4. first & third	Home Visit	Control	Home Learning Center/Home Visit	Test
5. first only	Home Visit	Control	Control	Test
6. second only	Control	Home Visit	Control	Test
7. HLC[1]			Home Learning Center/Home Visit	Test
8. controls	Control	Control	Control	Test

3-12 and 12-24 month phase supported by the Fund for the Advancement of Education (1966-67) and Children's Bureau, HEW (1967-69) (Gordon, 1967-69).

[1]Consisted of children recruited at age 2, not in previous control groups.

Table 2

Means and Standard Deviations on Stanford-Binet at ages 3, 4, 5 and 6 and Bayley at Age 2 by Number of Years and Timing of Participation in the Stimulation Program

			Age 2		Age 3		Age 4		Age 5		Age 6	
Group	Years	N	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	all 3	20	87.2	14.1	98.1*	16.7	98.4**	21.3	98.4*	13.6	97.4**	12.1
2	first 2	10	83.7	12.7	93.2	14.9	98.7*	11.5	93.7	11.1	99.5**	12.3
3	second 2	8	86.8	5.9	97.5	12.8	98.1**	11.8	94.0	13.4	94.8	6.1
4	first & third	7	80.0	8.6	91.0	10.6	90.6	14.3	93.6	13.7	89.6	11.4
5	first only	9	86.3	14.3	91.7	8.8	97.4	15.5	101.6*	14.0	94.4	12.1
6	second only	10	91.9	17.7	91.5	10.6	86.7	12.8	90.4	14.7	93.4	13.5
7	HLC	37	87.6	14.9	96.5	13.7	96.3*	11.6	93.0	19.7	95.5**	11.9
8	controls	41	89.3	14.1	92.0	10.9	90.5	12.3	91.5	11.2	90.2	10.1
	Total	142										

**Significantly greater than control at .025 for one-tailed test.
*Significantly greater than control at .05 for one-tailed test.

conducted with mothers at the time of testing at the child's sixth year. A significantly higher percentage of experimental mothers reported involvement in an educational program after project termination, higher educational expectations for her child, and more purchasing of toys and use of the toys in direct instruction of her child. There was also more personal activity by the mother in her use of community resources such as the library. These results are reported in the 1974 final report in Appendix A.

The Present Study

The present study was planned as a longitudinal extension of the measurement of effects. The objectives are:

Objective 1: To determine if differences found at age six between IQ scores of experimental and control children are maintained into the early school year.

Hypothesis 1: The performance on the Metropolitan Achievement Test will be significantly higher for those children in the experimental groups when compared with the control group.

Hypothesis 2: Fewer of the children in the experimental group than in the control group will have been (a) assigned to special education classes, (b) referrals for discipline problems, (c) singled out by teachers for psychological help, (d) held back a grade.

Hypothesis 3: Teachers will view the experimental children as exhibiting more positive social behavior and more positive task-oriented behavior than the control group as measured by the Classroom Behavior Inventory (Schaefer and Aaronson, 1965).

Objective 2: To determine if differences in parental attitudes and behaviors between experimental and control families are enduring into the early school years.

Hypothesis 4: Teachers will report that parents in the experimental group attend parent-teacher conferences and visit the classrooms more frequently than parents in the control group as measured by the Teacher Report of Parent Behavior (Schaefer et al, 1975).

Hypothesis 5: Teachers will view parents in the experimental group as more interested in their child's progress in school than parents in the control group as measured by the Teacher Report of Parent Behavior.

Chapter 2: Procedure

Sample

The original sample was from Alachua and the 11 surrounding counties and were coded "indigent" at the University hospital where the children were born. In addition, the infants were single birth, not breech or Caesarean delivery, no complications to the mother or infant, no evidence of mental retardation and no evidence of mother's mental illness.

New families were added into the original population beginning in November 1968. These children were two years old and were not previously in the program. Criteria for the selection of the new population were less stringent than those for the original population. However, the economic background of the family was similar to the original population.

Original Treatment Plan

Table 1 shows the treatment plan from age three months to six years. The first two years of the program consisted solely of weekly home visits. The third year continued the weekly home visit to the parent plus experiences for the children in a small group (five children) setting in a home twice a week for two hours each time. The treatment variables were: presence of instruction and the length and timing of instruction.

Present Sample

There were seven different treatment groups and a control group under study at age six. Results at age six, as shown in Table 2, indicated that children were benefiting from the treatment if their

families were in the program two or more consecutive years (Group 1, 2, 3) or they were in the third year only, the Home Learning Center (Group 7), when compared to the Control Group (Group 8) (Gordon and Guinagh, 1974). The other groups were not significantly different from the Control Group. In the present study, Groups 1, 2, 3 have been combined for the analyses and are referred to as the Longitudinal Group. Groups 4, 5, 6 could not be combined because of their dissimilarity and cannot be studied individually because the sample size is so small (5, 5, 4 respectively). The Home Learning Center Group (Group 7) and the Control Group (Group 8) continue as previously studied.

Attrition

The intervention phase of the parent education program ended at age three. At that time, 192 children were in 8 different groups. Three years later, after only yearly testing, there were 179 children in the study. These children became six years old between June, 1972 and November, 1973. The data in the present study was collected in the spring of 1976. At this time 104 of the families were contacted and agreed to participate in the follow-up. No families refused participation for this present study.

At age 6, there were 55 children in the Longitudinal Group (Groups 1, 2, 3) and in the present study there are 32. In the Home Learning Center there were 50 and now there are 38. In the Controls there were 51 and now there are 21. These are maximum sample sizes. Some of the data is missing since we were not able to get data from the schools or from the teachers for some of the measures. The attrition

rate is different for the three groups. Twenty-three children have been lost from the Longitudinal Group, or 42% attrition. In the Home Learning Center Group, 12 have been lost, or an attrition rate of 24%. In the Control Group 30 have been lost, or an attrition rate of 59%.

We examined the IQ scores for the children at ages 2, 3, and 6 that were still in the study compared to the original sample. There were no significant differences between these groups (see Table 3). Thus, although there has been considerable attrition, the present sample is representative of both the original group and those who were measured at age 6.

Instruments

Measures on Children

Achievement - At age six the results showed that children in the experimental group for all three years or for two consecutive years (the Longitudinal Group) were superior to Control children on the Stanford-Binet. Children in Group 7, the Home Learning Center, who were only in the program for the third year, were also superior to the Control Group.

There has been discussion of the need for what might be termed ecological measurement, that is, measurement of the child's performance in the actual setting over time, rather than on an IQ test. Our strategy, therefore, was to see what had actually happened to the children in school; how they were actually doing. This meant the use of a combination of school records and achievement measures rather than a continuation of Stanford-Binet or other individual intelligence testing.

Table 3

IQ Means at Ages 2, 3, and 6 for Original Group and Present Sample

	Original Group			1975-76 Group		
	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N
Group 1, 2, 3						
Bayley MDI[1]	85.59	11.64	53	85.85	12.66	32
S. B. 3[2]	97.25	14.84	48	95.73	15.00	31
S. B. 6	96.16	11.98	45	94.82	13.35	32
Group 7						
Bayley	90.60	18.74	74	85.50	12.86	38
S. B. 3	94.16	19.85	62	91.71	19.68	38
S. B. 6	94.23	12.71	49	91.44	13.05	37
Group 8						
Bayley	90.68	18.94	55	88.00	14.69	21
S. B. 3	91.39	10.92	50	90.58	9.78	21
S. B. 6	88.62	10.22	51	89.92	11.97	21

[1]Bayley Mental Development Index

[2]S. B. = Stanford Binet

Data collected by the schools was used. Seventy-five of the children took the Metropolitan Achievement Test, 11 took either the SAT or the CTBS. Some children did not receive a test because they were in special education classes or were ill.

Adjustment to School - The adjustment the child was making to school was examined by looking at the school files of the children for the number of children assigned to special education classes, referred for discipline problems, singled out by teachers for psychological help, and held back a grade.

Teachers' View of Children - Teachers filled out the Classroom Behavior Inventory (CBI), Short Form, K-12, by Earl S. Schaefer and May Aaronson on the children in their class who had been in the program. The teachers also filled out the CBI on other children to keep their views as unbiased as possible. Ninety teachers in 30 schools filled out 104 questionnaires. In addition, one child in each class who was not in the project was selected at random from the class roll and the teacher filled out a CBI on this child. This data was not used. It was collected so that the teachers would be unaware of which children were in the project. The teachers were told in general about the longitudinal nature of the program and our interest in learning how the children were presently functioning in the school.

Measures on Parents

Teacher Report of Parent Behavior - Teachers also filled out the Teacher Report of Parent Behavior by Schaefer, et al. This is a 70 item questionnaire that was filled out on parents by teachers. Teachers also filled out forms on children not in the project in order

tc eliminate bias. Some teachers were only able to partially fill out the questionnaire for the parents because they did not know the parents.

Chapter 3: Results

Hypothesis 1: The performance on achievement tests will be significantly higher for those children in the experimental groups when compared with the Control Group.

The school districts outside Alachua County did not use the Metropolitan Achievement Test (MAT), but used the Stanford Achievement Test (SAT) or the Comprehensive Test of Basic Skills (CTB). This affected 11 of the children. Since the tests have different norms and different subscales, we were not able to combine the tests. However, we were able to combine the two subscales that were present on all tests, Total Reading and Total Math.

Since children in special education classes such as TMR and EMR were not tested, in order to include them in the data, we looked at the number of children at or above "grade level."

We assumed that children so assigned would be functioning at least an academic year below grade level. If we had ruled them out, this would have introduced a systematic bias into our test score analysis, since a higher proportion of Control children (see Table 8) were so assigned.

Two standards of grade level were used: actual grade level (2.9, 3.9 or 4.9 on spring test administration) and only nine months behind grade level (2.0, 3.0 or 4.0 on same administration). As can be seen in Table 4, few differences between treatment groups are present at the more rigorous grade level standard. Although the percentage of longitudinal children at or over grade level is higher than Control children on eight of the nine scales, none of these reach statistical significance.

Table 4

Percentages of Children Above Grade Level (2.9, 3.9 or 4.9)

in 2nd, 3rd or 4th Grade on MAT, or CTB

	LONGITUDINAL			HOME LEARNING			CONTROL		
Test/Subject*	N	No. Ab. Gr. Level	%	N	No. Ab. Gr. Level	%	N	No. Ab. Gr. Level	%
Word Knowledge	30	6	20	36	2	6	14	0	7
Reading	30	2	7	36	4	11	13	1	0
Total Reading	33	4	12	38	3	8	20	0	5
Language	29	3	7	32	4	12.5	14	1	0
Spelling	28	7	25	35	7	20	13	1	8
Math Competence	30	2	7	35	5	14	14	1	7
Math Concepts	30	5	17	35	2	6	14	1	7
Math Problem Solving	30	3	10	36	3	8	13	1	8
Total Math	33	4	12	37	2	5	30	1	5

* All tests are MAT, except Total Reading and Total Math which include 11 children who took CTB's or SAT.

Table 5 shows the number of children that are nine months or less behind grade level. This analysis shows Reading significant at $p \leq .025$, and Total Reading (also combining other tests in addition to the MAT), Math Concepts, and Math Problem Solving to be significant at $p \leq .05$. This is graphically displayed in Figure 1. The Longitudinal Group is the most successful, followed by the Home Learning Center Group, followed by the Control Group. The hypothesis is confirmed for the Longitudinal Group. There is a trend for the Home Learning Center Group to have higher scores than the Control Group but this difference is not statistically significant.

Hypothesis 2: Fewer of the children in the experimental group than in the Control Group will have been (a) assigned to special education classes, (b) referrals for discipline problems, (c) singled out by teachers for psychological help, (d) held back a grade. Most of the children (83 out of 91) were in the third grade. Table 6 indicates the number of children in that grade who were assigned to special education other than Gifted or Speech and Hearing.

As seen in Table 6, for the children in third grade, two children had been assigned to special education (Educable Mentally Retarded, Trainable Mentally Retarded, Specific Learning Disability, Emotionally Mentally Retarded) in the Longitudinal Group, four in the Home Learning Center Group, and six from the Control Group. A χ^2 test gives $\chi^2 = 5.63$ which is significant at the $p \leq .1$ (see Table 6). By grouping both experimental groups together a 2 x 2 matrix can be analyzed (see Table 7). A χ^2 test (Siegel, 1956, p. 107, formula 6.4) gives $\chi^2 = 3.74$ which is significant at $p \leq .10$. The Chi Square test is a

Table 5

Number of Children Within School Year of Grade Level

in 2nd, 3rd, and 4th Grade in Spring, 1976 (2.0+, 3.0+, and 4.0+)

	LONGITUDINAL					HOME LEARNING CENTER			CONTROL		
Test/Subtest*	N	No. at G. Level	%	Z**	P	N	No. at G. Level	%	N	No. at G. Level	%
Word Knowledge	31	14	.452	1.05	NS	36	8	.222	14	4	.286
Reading	31	12	.387	2.05	.025	36	8	.222	13	1	.077
Total Reading	33	12	.364	1.67	.05	38	9	.237	20	3	.150
Language	30	11	.367	.53	NS	32	9	.281	14	4	.286
Spelling	29	14	.483	1.06	NS	35	12	.343	13	4	.308
Math Competence	31	13	.419	.85	NS	35	16	.457	14	4	.286
Math Concepts	31	14	.452	1.87	.05	35	9	.257	13	2	.154
Math Prob. Solv.	31	13	.419	1.69	.05	36	10	.278	13	2	.154
Total Math	33	13	.394	1.47	NS	37	11	.297	20	4	.200

* All tests are MAT, except Total Reading and Total Math which includes 11 children who took CTBS or SAT.

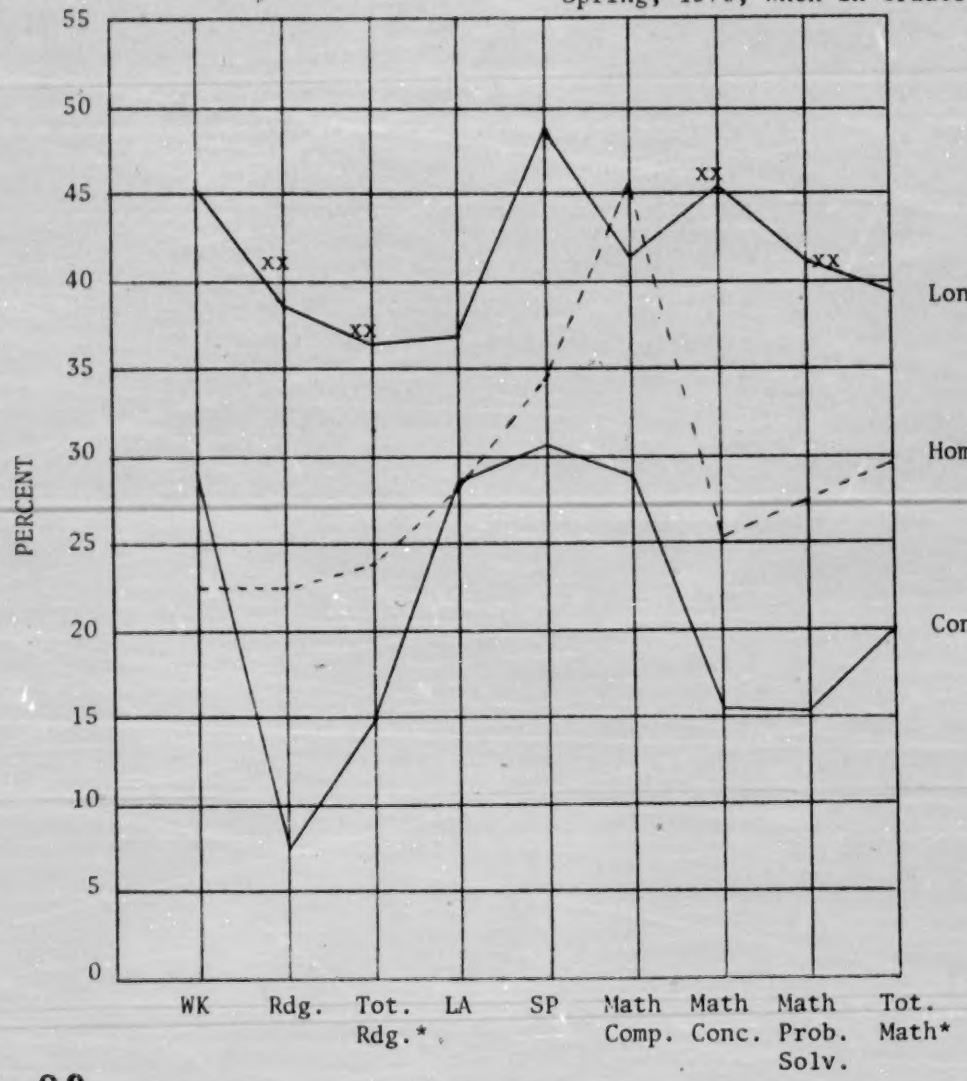
** Z Comparison of Longitudinal with Controls, one-tailed test.

NOTE: There are no significant differences between the Home Learning Center and Control groups.

Figure 1

Percent of Children Scoring 2.0+, 3.0+, and 4.0+ on MAT,

Spring, 1976, When in Grades 2, 3 and 4



*Total includes 2 Longitudinal, 2 Home Learning Center and 7 Controls who took CTBS or SAT, not MAT.

**P = .05, One-tailed test, differ from Controls

Longitudinal (2 or 3 years from 3 months to 36 months of age)

Home Learning Center Only (from 24 to 36 months)

Controls

Table 6

Number of Children in Third Grade Assigned to Regular or to Special Education (Educable Mentally Retarded, Trainable Mentally Retarded, Specific Learning Disability or Emotionally Disturbed) by Treatment

Groups	Assigned to Special Education	Not Assigned To SE*	TOTAL
Longitudinal	2	28	30
Home Learning Center	4	30	34
Control	6	14	20
TOTAL	12	72	84

$\chi^2 = 5.63$, 2 df, $p \leq .10$

*includes three longitudinal children assigned to gifted program and three in speech and hearing; one control in speech and hearing.

two-tailed test; our hypothesis was directional, so that the probability level is more approximately .05.

Table 8 shows the children in third grade who were assigned to either EMR or TMR. Grouping both experimental groups together, a 2 x 2 matrix gives a $\chi^2 = 5.13$ which is significant at $p \leq .025$ for a one tail test.

Three of the experimental children had been assigned to Gifted classes. None of the other children had been so assigned. Another way to look at assignment to special education is to see what happens to individual children. Table 9 indicates the number of children and the number of years they were so assigned. Inspection of this table indicates the tendency for Control children to spend more time in EMR classes than were the Longitudinal children who had ever been assigned to EMR.

Table 10 gives a more detailed description of these children. This table shows the individual children's IQ scores over time and how this score compared to the mean of the group to which the child was assigned. It is clear that Griffith's scores at age one were inadequate predictors of school assignment. The mean on the Griffith's for Longitudinal and Control children who were not assigned to special education was 107, for those assigned (excluding Gifted) it was 112. The Bayley and Stanford-Binet do somewhat better, but it is clear that something other than score accounts for school assignment. (See Appendix B for individual scores of the remainder of the children).

There were no significant differences between the groups in the number of children referred for discipline problems (none so referred), singled out for psychological help or retained at any time (see Table 11).

Hypothesis 2 was confirmed for assignment to EMR classes.

Table 7

Number of Children in Third Grade Assigned to Regular or to Special Education Classes (Educable Mentally Retarded, Trainable Mentally Retarded, Specific Learning Disabilty, Emotionally Disturbed) by Combined Treatment and Control Groups

Groups	Assigned to Special Education	Assigned to Regular	TOTAL
Treatment	6	58	64
Control	6	14	20
TOTAL	12	72	84

$\chi^2 = 3.74$, 1df, $p \leq .05$, one tail test

Table 8

Number of Children in Third Grade Assigned to Educable Mentally Retarded or Trainable Mentally Retarded by Combined Treatment and Control Groups

Groups	Assigned to EMR or TMR Classes	Assigned to Regular Classes	TOTAL
Treatment (Longitudinal and Home Learning Center)	3	61	64
Control	5	15	20
TOTAL			84

$\chi^2 = 5.13$, df = 1, $p \leq .025$, one tail test

Table 9

Number of Children Assigned to Special Education,

Years Assigned, and Type of Assignment

LONGITUDINAL GROUP (N=32)

Number of Years	EMR	ED	SLD	TMR	S&H	G
1	3	0	0	0	1*	0
2	1	1+	0	0	0	3
3	0	0	0	0	1	0
4	0	0	0	0	1	0

* One child was in EMR in 2nd grade, S&H in 3rd grade, regular 4th grade classroom.
\+ Child previously in SLD for one year.

HOME LEARNING CENTER GROUP (N=38)

Number of Years	EMR	ED	SLD	TMR	S&H	G
1	0	0	1	0	2+	0
2	2	0	1	0	0	0
3	1	0	0	1	0	0
4	0	0	0	0	0	0

\+ One child previously in SLD for one year.

CONTROL GROUP (N=21)

Number of Years	EMR	ED	SLD	TMR	S&H	G
1	2*	0	1	0	0	0
2	1	0	0	0	1	0
3	1	0	1	0	0	0
4	1	0	0	0	0	0

* Two children in third grade only.

Table 10

IQ Scores for Those Assigned

to Special Education

(EMR, TMR, SLD, SH, ED, G)+

Longitudinal Group

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments
1.	M	100	79	96	96	98	96	EMR in grade 1 only, now in grade 4
2.	M	115	74*	75*	64*	83*	74*	SH in grades 2, 3, 4
3.	M	119	100**	85	66*	91	93	SLD in 2, SH in 3, regular program in 4
4.	M	120	88	75*	94	110	100	EMR in 2, 3, regular program in 4
5.	F	107	72*	77*	66*	74*	85*	SH in K, 1, 2, 3
6.	F	105	85	85	90	80*	80*	EMR in 4 only
7.	M	114	73*	89	82	81*	97	EMR in 1, regular class in 2, 3, 4
8.	F	126	87	111	105	105	--	SLD in 1, ED in 2 & 3
9.	M	117	91	130**	129**	129**	128**	gifted in 3, 4
10.	F	123	--	114**	115**	109	111**	gifted in 2, 3
11.	F	122	112**	118**	133**	114**	113**	gifted in 2, 3

* = more than one SD below group mean

** = more than 1 SD above mean

\+ EMR - Educable Mentally Retarded
TMR - Trainable Mentally Retarded
ED - Emotionally Disturbed
SLD - Specific Learning Disability
SH - Speech and Hearing
G - Gifted

Table 10 - Continued

Home Learning Center Group

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments
1.	M	--	87	84	76*	92	81*	SLD in 4
2.	M	--	71*	84	94	94	88	SH in 4
3.	M	--	--	80*	86	74*	76*	SLD in 2, 3
4.	M	--	64*	--	--	60*	66*	TMR in 1, 2, 3
5.	M	--	82	106	92	103	99	SLD in 3, SH in 4
6.	M	--	111**	109	107	101	85	EMR in 1, 2, 3, regular program in 4
7.	M	--	62*	65*	80*	74*	85	EMR in 1, 2, regular program in 3
8.	F	--	85	--	90	93	88	EMR in 1, 2, regular program in 3

Control Group

1.	F	111	84	92	103	87	91	EMR in 3
2.	F	99	74*	77*	74*	69*	72*	EMR in 1, 2, 3, 4
3.	M	122	98	96	105	96	93	EMR in 2, 3
4.	F	110	91	96	74*	72*	82	SLD in 1, 2, 3
5.	F	--	88	84	82	96	85	EMR in 2, 3, 4
6.	F	--	91	89	90	89	94	SH in 2, 3, regular program in 4
7.	M	--	96	102	109	107	91	SLD in 1 only, now in 4
8.	M	--	88	101	78*	78*	82	EMR in 3

* = more than one SD below group mean

** = more than 1 SD above mean

Table 11

Number of Children with Various Problems

Groups	Singled Out for Psychological Help	Retained at Any Time
Longitudinal (N-32)	2	3
Home Learning Center (N=38)	2	2
Control (N=21)	2	2

Hypothesis 3: Teachers will view the experimental children as exhibiting more positive social behavior and more positive task-oriented behavior than the Control Group as measured by the Classroom Behavior Inventory (Schaefer and Aaronson, 1965).

The 90 teachers in the 30 schools which contained experimental and control pupils were asked to fill out the 18 item Classroom Behavior Inventory for these children and an additional number of children in their classroom so that the teacher was unaware as to which particular children were from our population. They were told about the background of the program and purpose of the present information. The responses were examined item by item as well as by factor score. Tables 12 and 13 present the item scores and factor scores by group. Items on this scale were combined based upon Schaefer's (1975) analysis of the inventory. The three factor structures are Hostility versus Considerateness, Task-Orientation versus Distractibility, and Extroversion versus Introversion. There were no significant differences among the groups; the hypothesis was not confirmed.

Hypotheses 4 and 5 both use the Teacher Report of Parent Behavior:

Hypothesis 4: Teachers will report that parents in the experimental group attended parent-teacher conferences and visited the classrooms more frequently than parents in the Control Group.

Hypothesis 5: Teachers will view parents in the experimental group as more interested in their child's progress in school than parents in the Control Group as measured by the Teacher's Report of Parent Behavior.

This instrument was developed by Earl Schaefer. Our personal correspondence with him did not yield any reliability or validity

Table 12

Item Scores by Group for Classroom Behavior Inventory

Item	Longitudinal	Home Learning Center	Control
1. Laughs and smiles easily and spontaneously in class.	3.28* (N=32)	3.32 (N=38)	3.52 (N=21)
2. Works earnestly at his classwork; doesn't take it lightly.	3.00 (N=32)	3.19 (N=37)	2.62 (N=21)
3. Has a low, unsteady or uncertain voice when speaking to teacher or a group of classmates.	2.25 (N=32)	2.50 (N=38)	2.55 (N=20)
4. Is quickly distracted by events in or outside the classroom.	2.91 (N=32)	2.74 (N=38)	3.19 (N=21)
5. Tries to get even child with whom he is angry.	2.50 (N=32)	2.47 (N=38)	2.55 (N=20)
6. Awaits his turn willingly.	3.03 (N=32)	3.24 (N=38)	3.19 (N=21)
7. Is usually sad, solemn and serious looking.	1.84 (N=31)	1.95 (N=38)	1.85 (N=20)
8. Likes to express his ideas and views.	2.81 (N=32)	2.61 (N=38)	2.70 (N=20)
9. Sometimes pays attention; other times must be spoken to constantly.	2.58 (N=31)	2.51 (N=37)	3.14 (N=21)
10. Watches carefully when teacher or classmate is showing how to do something.	2.94 (N=32)	2.97 (N=38)	2.65 (N=20)
11. Gets angry quickly when others do not agree with his opinion.	1.97 (N=32)	2.05 (N=38)	2.35 (N=20)
12. Does not wait for others to approach him, but seeks out others.	2.41 (N=32)	2.55 (N=38)	2.95 (N=20)
13. Tries not to do or say anything which would hurt others.	2.58 (N=31)	2.84 (N=38)	2.86 (N=21)
14. Often cannot answer a question because his mind has wandered.	2.56 (N=32)	2.42 (N=38)	2.71 (N=21)

* 1 = Very Much Like, 2 = Somewhat Like, 3 = Very Little Like, 4 = Not at All Like

Table 12 - Continued

Item	Longitudinal	Home Learning Center	Control
15. Gives the other an opportunity to express his point of view.	3.06* (N=32)	3.38 (N=37)	2.90 (N=20)
16. Ridicules and mocks others without regard for their feelings.	1.91 (N=32)	1.82 (N=38)	2.00 (N=20)
17. Tends to withdraw and isolate himself even when he is supposed to be working with a group.	1.88 (N=32)	2.05 (N=38)	1.90 (N=20)
18. Sticks with a job until it's finished, even if it is difficult for him.	2.75 (N=32)	2.82 (N=38)	2.67 (N=21)

* 1 = Very Much Like, 2 = Somewhat Like, 3 = Very Little Like, 4 = Not at All Like

Table 13

Means and Standard Deviation for

Factor Scores for Classroom Behavior Inventory

Factor	Longitudinal N=32	Home Learning Center N=38	Control N=21	F
Hostility vs. Considerateness (Items 5, 11, 16 minus 6, 13, 15)	-2.22 (4.5)	-3.03 (4.2)	-2.23 (5.0)	0.35
Task-oriented vs. Distractibility (Items 2, 10, 18 minus 4, 9, 14)	0.72 (4.6)	1.29 (4.4)	-1.23 (4.1)	2.29
Introversion vs. Extroversion (Items 3, 7, 17 minus 1, 8, 12)	-2.59 (4.5)	-1.97 (3.8)	-2.90 (3.8)	0.41

F tests N.S. at .05

information. We are unable therefore to estimate whether the response we received from teachers is typical of such response or not. Since only 10 of the 61 items showed significant difference between the experimental and Control Group, no further analysis was run since this finding may be a function of chance (see Table 15). Tables 14 and 15 give the data for all the items on the instrument.

Items 1 through 17, with the exception of 5, 6 and 7 in Table 14 relate specifically to Hypothesis 4, "parents in the experimental group will attend parent-teacher conferences and visit the classroom more frequently than parents in the control group." In general, the amount of contact between home and school was minimal. These forms were filled out during the middle of the school year, so perhaps later in the year there would have been more contact. The number of parents contacting teachers was so small that no statistical test can be run. There does not appear to be any significantly different patterns between the three groups. Combining all groups, the number of mothers who dropped by never exceeded 26% (Table 14, Item 4). Only 28.5% discussed the needs or problems of the child with the teacher (Table 14, Item 12). 18.7% volunteered to help during the year (Table 14, Item 14), and 24% brought in books, pictures, plants, refreshments, etc. for the class (Table 14, Item 17). As indicated above, we have no base line or reference data to know whether these percentages are typical either of the population from which our sample was drawn, or of the general public school population.

Item 22 in Table 14 shows that the teachers found that their contacts with the mother had been useful with 41% of the families and

Table 14

	LONGITUDINAL						HOME LEARNING CENTER						CONTROL					
	No Ans.	None	1	2	3	4-9	No Ans.	None	1	2	3	4-9	No Ans.	None	1	2	3	4-9
How frequently has this mother:																		
1. asked for special conference	8	20	1	1	1	0	8	25	3	0	1	1	0	19	1	1	0	0
2. telephoned	8	19	3	0	0	1	8	23	5	1	1	0	0	17	3	1	0	0
3. written a note (other than a required excuse)	8	17	4	1	0	1	0	22	2	1	3	2	0	15	3	0	2	1
4. dropped by informally to talk about child	8	14	4	4	0	1	8	18	3	3	3	3	0	18	2	1	0	0
How frequently have you:																		
5. asked for a special conference	8	15	4	2	2	0	8	16	6	6	1	1	0	14	2	2	2	1
6. telephoned	8	19	3	0	0	1	8	23	5	1	1	0	0	18	1	1	1	0
7. written a note	8	9	7	3	2	2	10	11	5	3	5	4	0	7	3	1	3	7
How frequently has this mother:																		
8. given information about child's interests, skills, etc.	8	16	5	1	0	1	8	22	3	1	1	3	0	16	5	0	0	0
9. suggested ways of working with him	8	19	2	2	0	0	8	25	2	1	2	0	0	19	2	0	0	0
10. asked for ways to encourage the child's learning	8	20	1	2	0	0	8	21	2	1	1	5	0	16	2	2	0	1
11. asked for suggestions about TV, books, trips, etc.	8	20	2	1	0	0	8	26	3	0	0	1	0	21	0	0	0	0

Table 14 - Continued

	LONGITUDINAL						HOME LEARNING CENTER						CONTROL					
	No Ans.	None	1	2	3	4-9	No Ans.	None	1	2	3	4-9	No Ans.	None	1	2	3	4-9
How frequently has this mother:																		
12. discussed the needs or problems of the child	8	15	5	2	1	0	8	17	3	3	0	7	0	16	2	1	1	1
13. discussed dissatisfactions with class or teacher	8	22	1				8	26	2	1	1	0	0	18	2	1	0	0
14. volunteered to help during the year (parties, field trips, etc.)	8	17	4	2			8	22	4	3	0	1	0	18	2	1	0	0
15. offered to act as a resource person	8	23					8	30	0	0	0	0	0	21	0	0	0	0
16. sent in resource materials for class	8	20	0	2	1		8	26	1	2	1	0	0	20	1	0	0	0
17. bought books, pictures, plants, refreshments, etc. for class	8	15	4	1	2	1	8	20	2	2	3	3	0	17	3	1	0	0

Table 14 - Continued

	LONGITUDINAL				HOME LEARNING CENTER				CONTROL			
	No Ans.	Yes	No	Don't Know	No Ans.	Yes	No	Don't Know	No Ans.	Yes	No	Don't Know
Does this child:												
18. read and study beyond homework and assignments	9	5	10	7	8	17	3	10	1	3	10	7
19. bring in unsolicited books and materials for own use	9	7	13	2	7	5	16	10	1	3	16	1
20. watch TV of educational value	9	5	2	5	8	5	0	25	1	3	0	17
21. have out-of-school learning experiences such as clubs, lessons, camp, etc.	9	3	7	12	8	8	6	16	0	2	6	12
	No Ans.	Not Useful	Useful		No Ans.	Not Useful	Useful		No Ans.	Not Useful	Useful	
22. Has the contact with the mother been:	10	10	11		11	9	18		2	11	8	
	No Ans.	Too Little	About Right	Too Much	No Ans.	Too Little	About Right	Too Much	No Ans.	Too Little	About Right	Too Much
23. From your point of view, has the amount of contact been:	9	15	6	1	8	17	12	1	1	16	4	

Table 14 - Continued

	LONGITUDINAL				HOME LEARNING CENTER				CONTROL			
	No Ans.	None	Some	Much	No Ans.	None	Some	Much	No Ans.	None	Some	Much
24. How much contact have you had with the child's father:	9	19	2	1	8	24	5	1	1	18	2	0
25. How much contact have you had with the child's other relatives:	9	15	6	1	11	22	7	0	2	12		7

Table 15

Means and Standard Deviations for

Teacher Report of Parent Behavior Items

Item	Longitudinal	Home Learning Center	Control
1. Expresses an appropriate level of interest in her child's progress in school.	2.9*(1.2) N=22	3.1 (.9) N=28	2.2 (.9) N=17
2. Expects me to train the child in ways in which she should have trained him herself.	2.1 (1.1) N=18	1.9 (1.0) N=23	2.2 (1.0) N=13
3. Pushes him too hard.	1.9 (1.0) N=20	1.8 (.9) N=26	1.6 (.9) N=14
4. Will not admit her child's faults.	2.3 (1.1) N=16	1.8 (.8) N=24	2.4 (.8) N=12
5. Seems ill-at-ease with me.	1.6 (.7) N=16	1.8 (1.0) N=22	2.0 (1.1) N=10
6. Would back me up if I had to discipline her child.	3.3 (.8) N=18	3.6 (.7) N=23	2.9 (.7) N=15
7. Cooperates with me in teaching her child.	3.2 (.9) N=17	3.2 (.9) N=27	2.6 (.8) N=15
8. Tries to influence me too much.	1.6 (1.1) N=16	1.2 (.6) N=25	1.6 (1.0) N=13
9. Doesn't accept the suggestions I make.	1.6 (.7) N=15	1.8 (1.1) N=25	1.8 (.7) N=12
10. Appreciates my making suggestions about activities that could be done at home with her child.	3.3 (.9) N=16	3.1 (1.0) N=25	2.5 (.8) N=12
11. Appreciates what I do for her child.	3.2 (.8) N=17	3.4 (.9) N=25	3.1 (.8) N=13
12. Expects me to give too much individual attention to her child.	1.9 (1.0) N=16	1.5 (.6) N=23	1.8 (1.0) N=12
13. Helps me work with her child more effectively.	2.2 (.9) N=17	2.6 (.9) N=24	2.3 (.8) N=12

* 1 = Not at All Like, 2 = Very Little Like, 3 = Somewhat Like, 4 = Very Much Like

Table 15 - Continued

Item	Longitudinal	Home Learning Center	Control
14. Seems unconcerned about her child's education.	2.2*(1.2) N=19	1.8 (1.2) N=27	2.1 (1.0) N=13
15. Comes in whenever invited.	2.7 (1.0) N=18	2.5 (1.1) N=26	2.5 (1.1) N=11
16. Is doing a good job in helping her child learn.	2.6 (1.1) N=20	2.7 (.9) N=24	2.1 (.9) N=13
17. Provides health and dental care for child as needed.	3.2 (.7) N=19	3.2 (.9) N=24	3.2 (.6) N=13
18. Tells me about her hopes and fears concerning the child.	2.4 (1.1) N=16	2.3 (1.0) N=21	1.9 (1.0) N=13
19. Holds back information that would be useful to me.	2.0 (1.0) N=14	2.0 (1.0) N=23	2.0 (.9) N=10
20. Places the right amount of emphasis on her child's doing well in school.	3.0 (.9) N=18	3.0 (.9) N=23	2.5 (.9) N=14
21. Expects me to make up for her own mistakes with the child.	2.1 (1.1) N=16	1.7 (.9) N=21	1.8 (.9) N=12
22. Tries to make the child achieve beyond his ability.	1.6 (1.0) N=18	1.9 (.9) N=23	1.8 (1.0) N=11
23. Sticks up for her child, even when it is obvious that the child is wrong.	1.9 (.9) N=16	1.4 (.7) N=22	1.8 (1.0) N=10
24. Is self-conscious and uncomfortable with me.	1.4 (.7) N=16	1.8 (.1) N=19	1.8 (.9) N=8
25. Supports my methods of discipline.	3.3 (.9) N=13	3.4 (1.0) N=23	3.2 (.7) N=13
26. Supports what I try to do.	3.1 (1.0) N=17	3.4 (.9) N=25	3.1 (.7) N=14
27. Criticizes my teaching methods.	1.4 (.6) N=15	1.4 (1.0) N=23	1.6 (.9) N=12

* 1 = Not at All Like, 2 = Very Little Like, 3 = Somewhat Like, 4 = Very Much Like

Table 15 - Continued

Item	Longitudinal	Home Learning Center	Control
28. Is often indifferent to my ideas for her child.	1.8*(.8) N=16	1.6 (.1) N=24	1.9 (.2) N=13
29. Is interested in having my ideas about how she can work with her child.	2.6 (.9) N=16	3.0 (1.3) N=23	1.9 (1.0) N=12
30. Often thanks me for teaching her child.	2.1 (.9) N=16	2.6 (1.3) N=22	1.8 (1.1) N=13
31. Wants me to make special exceptions for her child.	1.6 (.8) N=16	1.3 (.6) N=22	1.5 (.9) N=11
32. Provides useful information about her child.	2.2 (1.0) N=17	2.4 (1.0) N=23	1.7 (.9) N=13
33. Shows little interest in helping her child learn.	2.1 (1.0) N=19	1.6 (.9) N=23	2.8 (1.0) N=12
34. Is always willing to help.	2.6 (1.0) N=18	3.0 (1.1) N=25	2.2 (.9) N=13
35. Provides educational experiences.	2.5 (.9) N=18	2.6 (.8) N=23	1.8 (.8) N=10
36. Provides adequate nutrition for the child.	3.2 (.6) N=14	3.2 (.7) N=24	3.3 (.6) N=14
37. Talks over the child's problems with me.	2.1 (1.0) N=18	2.5 (1.1) N=24	1.7 (.9) N=12
38. Resists discussing things I think are important.	1.8 (.8) N=17	1.5 (.9) N=21	1.5 (.8) N=11
39. Motivates the child to do well in school without pressuring him too much.	2.4 (1.1) N=15	2.5 (.9) N=21	2.5 (.8) N=11
40. Doesn't bother to discipline her child and then expects me to do it.	1.8 (.9) N=16	1.2 (.4) N=21	1.9 (1.1) N=12
41. Demands too much of her child.	1.6 (.9) N=17	1.7 (.8) N=22	1.8 (.9) N=11

* 1 = Not at All Like, 2 = Very Little Like, 3 = Somewhat Like, 4 = Very Much Like

Table 15 - Continued

Item	Longitudinal	Home Learning Center	Control
42. Feels her child can do no wrong.	1.9*(1.0) N=16	1.4 (.6) N=21	1.5 (.7) N=11
43. Hesitates to talk with me.	1.7 (1.0) N=17	1.9 (1.2) N=25	2.2 (1.1) N=11
44. Accepts my methods of classroom management.	3.1 (1.0) N=16	3.5 (.7) N=21	3.1 (.7) N=11
45. Is my ally in the child's education.	2.9 (1.0) N=12	2.8 (1.1) N=19	2.6 (.9) N=11
46. Tries to force her ideas on me.	1.4 (.9) N=16	1.3 (.7) N=23	1.6 (1.0) N=13
47. Doesn't want help from me.	1.5 (.6) N=16	1.5 (.9) N=24	1.7 (1.2) N=12
48. Wants me to tell her how to help her child learn.	2.3 (1.0) N=16	3.0 (1.2) N=24	2.2 (1.0) N=13
49. Is good about letting me know that she appreciates my efforts.	2.0 (1.0) N=17	2.6 (1.2) N=25	1.8 (.9) N=13
50. Thinks her child should have special privileges.	1.8 (.9) N=16	1.5 (.7) N=22	1.6 (1.0) N=11
51. Has helped me understand her child better.	2.1 (.9) N=19	2.7 (.9) N=23	1.9 (.7) N=12
52. Does little to encourage the child to do well in school.	1.8 (.9) N=17	1.8 (1.1) N=22	2.0 (.8) N=11
53. Cooperates in every way.	2.7 (.9) N=18	3.1 (1.0) N=24	2.1 (1.0) N=11
54. Provides books and educational material for the child.	2.5 (1.2) N=16	2.6 (1.1) N=19	2.3 (1.0) N=9
55. Gives the child good physical care.	3.4 (.8) N=16	3.3 (.6) N=23	3.2 (.6) N=13
56. Tells me about things that concern her in relation to the child or the school.	2.4 (1.2) N=17	2.3 (1.0) N=21	1.8 (1.2) N=12

* 1 = Not at All Like, 2 = Very Little Like, 3 = Somewhat Like, 4 = Very Much Like

Table 15 - Continued

Item	Longitudinal	Home Learning Center	Control
57. Is evasive about the child.	1.8*(.8) N=14	2.0 (1.2) N=22	2.3 (1.1) N=9
58. Has never taught her child to respect authority but expects me to be able to handle him well.	2.0 (1.1) N=18	1.2 (.5) N=22	2.0 (1.3) N=13
59. Gives me credit for helping her child.	2.7 (1.0) N=15	3.0 (1.1) N=23	2.3 (1.0) N=11
60. Takes little responsibility for motivating the child.	2.3 (.9) N=16	1.8 (.9) N=22	2.4 (.8) N=11
61. Is secretive about the child.	1.6 (.9) N=14	1.5 (1.0) N=22	2.2 (1.1) N=10

* 1 = Not at All Like, 2 = Very Little Like, 3 = Somewhat Like, 4 = Very Much Like

not useful with 33% of the families. For the remaining percentage there was no contact (26%). Without comparative data, one cannot say that the general level of home-school relationships is exceptional but the pattern is one of low contact.

The teachers reported on four items of child behavior which are reflective of parental interest of child progress in school. That is, teacher's knowledge that the child reads and studies beyond homework, brings in unsolicited materials, watches educational television and has out-of-school learning experiences. For the purposes of analysis, the know and don't know categories were combined to make a more conservative estimate. A chi-square analysis was performed on the "yes" versus the combination of know and don't know. Only one item (child reads and studies beyond homework) proved to be significant at better than the 0.5 level (chi-square = 8.75). The numbers indicate that the Home Learning Center only group is responsible for this difference. There should have been only 10.5 expected and there were 17 yes answers. On the basis of the two teacher report instruments, Hypotheses 4 and 5 are generally not sustained.

Summary of Results

The hypotheses may be grouped into two categories: "hard" test score and school assignment data and "soft" teacher rating of child and parent behavior data. The results indicate that, on the former, there are clear lasting school achievement and performance effects for children who were in the parent education program with their parents for two or three consecutive years ending when they were two or three years old. This effect has lasted up to six years after the

end of the program. It is demonstrated both in achievement test scores and assignment to special education. The results are less profound for those who were in the program for only one year from age two to three. The effect is demonstrated somewhat in school assignment, but is not clear-cut in achievement test scores.

The rating scale data do not indicate that, as far as teachers can tell or rate, that parent or child behavior was different as a function of the program.

Chapter 4: Discussion

Longitudinal Effects

The data presented above indicates that the Florida early child stimulation through parent education projects for the parents and their children beginning when the child is three months of age until he is three years of age has long term effects on the school achievement and performance of the children. The most effective results were achieved by those children whose families were in the program for a minimum of two to the maximum of three consecutive years beginning either when the child was three months old or one year old. The previous study (Gordon and Guinagh, 1974) had indicated that this group consistently exceeded the control population and maintained this steady path up through age six as measured by the Stanford-Binet. The present study indicates the continuation of these effects in an even more profound manner. Why more profound? First, because the effects are still present an additional two and a half years later, and second the effects are clearly visible in the school situation, specifically in the school's assignment of children to special education programs.

A further discussion of our selection of achievement criteria is in order. We chose to use grade equivalence rather than percentiles for the analysis of the achievement test scores because this permitted us to include data from children who did not take the achievement test because they were assigned to EMR or TMR. Although we were sure these children were below grade level, we had no way to assign them a percentile score. In addition, percentile scores are affected severely

by the grade level of the child. Our choice was to look at grade equivalence, but to treat the data in categories (either above or below the particular grade equivalent), rather than as continuous data. The categorical approach gives a clearer picture of the number of children performing at a particular level. Ideally it would be useful to know how children in the school system with similar demographic characteristics to our population were performing. At present, this is beyond the capability of the school district.

Another base line reference we attempted was to find the total population of those with similar demographic characteristics, in special programs or assigned to mental retardation classes. We received some general information from the Alachua school system that approximately 20 percent of the children coming from the social and economic backgrounds of our children would be expected to have been assigned to special education in the third grade. A glance at our tables would indicate that our experimental groups were considerably below that expectation while the control group was above it.

To what do we attribute the lasting effects on children? We can to some degree only speculate, but we would assign the major factor to the impact of this program on the family. The previous project (Gordon and Guinagh, 1974) included interview data on the parents which indicated differences in the home learning environment for the Longitudinal children compared to Controls. The mothers of the Home Learning Center children also tended to differ on such items as concern for language development, availability of reading materials and press for reading from Control parents.

We are fairly confident that the particular activities demonstrated to the parents did not operate in any one-to-one fashion with the current school achievement measures. Obviously the types of knowledge and skills measured on math subscales of the MAT do not relate closely to infant or toddler activities. However, our general emphasis throughout the program was on improving communication, particularly the verbal communication, in the home between parent and child through cognitively oriented activities. These activities are contained in Baby Learning Through Baby Play (Gordon, 1970) and Child Learning Through Child Play (Gordon, Guinagh and Jester, 1972). What is more likely is that the program brought about a change in the mother's perception of herself and her child, in her role as teacher of her child, and some change in the motivational as well as cognitive system of the child.

Results also indicate that effects are a function of the length of time in the program. It seems this type of program requires involvement for at least two years in order for lasting effects to be reasonably expected. Previous analyses indicated that up until age five the children who had been in the program for only one year (3 months to 12 months of age) were significantly higher than Controls on the Stanford-Binet, and at age 6 the Home Learning Center children (2 years to 3 years of age) were also higher than their Controls. Unfortunately attrition made it impossible to pursue the first group. The clearest picture however, through past analysis, has been the continuing effect of the three years and the two continuous years in the program.

These results may be viewed as profound and important for another reason. The program represented a minimal amount of intervention. The

paraprofessional home visitor was recruited from the community and worked on a one-to-one basis with parents at home. The amount of intervention was limited. Homes were scheduled to be visited only once a week, but were in fact visited only approximately two weeks out of three. The time spent in each visit was usually less than an hour. The activities were simple and made use of objects already in the homes. The information conveyed was a demonstration of activities and encouragement to the mother to not only use these during the week but to develop her own. Further, we were developing the program while we were implementing it so that many of the activities were developed, especially in the Home Learning Center program, cooperatively by the staff, the parent educators, and the parents in whose homes these centers were located.

This program had been conceived originally as an educational experiment and therefore no comprehensive services were included. Whatever services were offered came about in an informal fashion as the parent educators developed a sensitivity to the needs of the family and as they were introduced to the resources of the community during inservice training.

Further, our philosophical orientation meant that neither the parent educators nor the parents were specifically trained in contingency management or other specific teaching behaviors. Rather, the emphasis was on demonstrating the activities. The particular teaching style evolved from the activity itself. The activities were essentially of a Piagetian orientation, that is, they stressed cognitive, problem solving types of activity. There was an emphasis on increasing the

amount of language interaction between parent and child. However, even in the language area there was no attempt to change the parents' style of expression or type of language usage. Rather the effort was on simply increasing the amount of dialogue and the use of the activities as a means to that end. That the program was accepted by the families seems clear from the willingness of the parents to continue to participate whenever we are able to locate them for follow-up, and the low attrition rate reported in 1974 for the Home Learning Center Project.

When we began this program in 1966 we raised three questions. First, could a home visit program using paraprofessionals as the key educators be sustained for children from three months of age to three years of age and their mothers? The answer is yes. Second, can materials be developed which can be easily used by the mother and child when demonstrated by professionals? The development and publication of the activities leads to the answer, yes. Third, could such a program make a difference several years later? The results lead to the answer yes.

Implications for Service

What are the implications of these answers? The project has served as a model for some of the operation of Parent and Child Centers, Parent Child Development Centers, Home Start programs, Head Start programs, Home Base programs, Follow Through efforts and programs for special education sponsored by the Bureau of Educationally Handicapped. Although such use began in the late 1960's, there was the continuous question as to its validity. Now we know not only the technology of such programs, but also that our results indicate that such a program can be successful.

Several years ago, when concerns were being expressed about deprivation versus difference models, questions were raised about the appropriateness of our materials both for the population with whom we were working and for similar populations. It is clear today that the activities developed as a result of both the original Parent Education Project (Gordon, 1967) funded by the Fund for the Advancement of Education, Baby Learning Through Baby Play and the various projects supported by HEW including the Home Learning Center Project, Child Learning Through Child Play are not culturally specific. They do not require any assumptions about cultural deprivation or cultural difference in order to be used. The easiest proof of this statement is that both books have been published in England and translated into Japanese, Italian and German with plans for translation into Hebrew. Parenthetically it should be noted that all the royalities from Child Learning Through Child Play are returned to the National Institute of Mental Health. Baby Learning Through Baby Play was not developed on federal funds.

With emerging concern for cross generational efforts and parenting education programs for high school youth, our program offers a possible model for the involvement of such youth in a program that not only is socially useful in the community but also provides youths with understanding of families and of child development in ways that should impact upon their own roles as parents. It would be rather easy to incorporate the type of home visit program we have developed, with suitable supervision, into a variety of high school efforts in which high school youth are trained as home visitors. It can easily be

incorporated into such programs as Exploring Childhood. Further, in the many places in which infant centers are located on school grounds, the activities developed here lend themselves to use in infant and early childhood centers. Indeed, the materials have been used in a variety of day care settings in the United States, Europe, South Africa and Australia.

The concept is relatively simple. There are training and supervisory requirements, which have been spelled out in previous reports. Further, since so many OCD supported programs, such as Home Start, Parent and Child Centers, Parent Child Development Centers, and Child Development and Family Resources, have developed elements of home training programs, it is possible to utilize this approach as a service element in virtually any community in this country. It can be located in community mental health centers, in community action agencies, in other government agencies or within the school system.

Implications for Research

Any program of research always suggests additional research. First, although it is clear that the effects of this program are lasting, it is important that further longitudinal work be done. We are currently engaged, through an additional OCD grant, in such an effort. Basic to that effort is collaborative work with other investigators as part of the Education Commission of the States task force on developmental continuity who have been involved in early intervention to see in what ways the results from this study and their studies can be combined to make a clearer picture of the lasting effects of early intervention.

This project itself needs research replication. There is always the danger of overgeneralizing from a single study, although the size of the sample here is larger than that of most comparable studies.

A new line of research concerned with the process of parent child interaction emerged from our earlier efforts and has been pursued through two completed NIMH projects [Instructional Strategies in Infant Stimulation (Gordon and Jester, 1972), and The Social Roots of Competence (Gordon, 1974)] and is currently being pursued in a third project supported by the National Institute of Mental Health entitled Parent-Child Transactions and Infant Competence (Gordon, 1976). Our current concern is to get a finer understanding of the ways in which mother, father, and child transact with each other around these activities. A major question is: What relationships do such transactions in a structured activity setting have on the development of the child? Findings from the two completed projects indicate that there are observable transactional behaviors emerging in the first year of life which are predictive of Bayley Mental Development Index scores and Piaget-type performances at least at age one. The present study includes fathers, who have often been overlooked in child development research. Findings from this new study, and similar ones, can easily be fed into high school parenting education programs and community service programs as they emerge. The changing roles of fathers in child development requires a considerable body of new research investigations to give us the data base for coming up with practical programs for assisting fathers in playing effective roles in the lives of their very young children.

A further implication, which cuts across both practice and research, is the fact that this program was conducted within a College of Education and was begun at a time when infant education was not conceived of as a part of the usual mission of such a college. There has accumulated a considerable body of information about the role of the home as an influence on the achievement of the child in school. Indeed, it was such information which lead into this project. However, this information has not yet been utilized by either schools of education in the development of both the undergraduate and graduate training programs or by school systems as they seek ways of working with parents of both school age children and children as young as infants. The results of this study and other studies like it should have an impact on the missions of schools of education and school systems as they come to grips more and more with the need to develop new modes of home-school interaction. The Florida Follow Through Project, which was modeled upon the home visit program, is but one example of the combination of research and in-service needed to find linkages in ways which the school system and the families can supplement each other in assisting the child to reach full development. Federal requirements for the education of handicapped persons also point the way to changes of mission in schools of education and school systems in relating to the parents of very young children. We believe the success of this program offers clues as to one way to proceed. We make no claims that there are not other valuable ways. But we know at least that this one works.

This project dealt only with what may be called the micro-system of the family. The project influenced the performance of the child in

the other micro-system known as the school. Further service-research combination programs need to investigate and create new models for examining a broader ecological view of the family and child within the social system. We need to study such issues as: In what way does a local community enhance or destroy family life? In what way do state and Federal programs encourage or inhibit family-agency interactions? In what ways do changes within the micro-system of a family bring about changes in the family's impact on the social system? Such questions were obviously beyound our scope as we began this work in 1966. Because of what we have found and done, and because of what others are finding, these questions now become appropriate. We hope that they will be addressed in further research.

Conclusions

The results indicate that, as measured by assignment to EMR or TMR classes and scores on scholastic achievement tests, the effects of early intervention through parent education persist through the third grade. The effects are clearest for those children whose parents were in the home visit program for combinations of two or three consecutive years beginning when the child was either three months or 12 months old and ending when the child was 36 months old. The effects have thus lasted about six years. We assume changes in parental and child motivation and competence are the bases for this result. Implications are drawn for both practice and further research, and for a new view of the mission of educational institutions.

Chapter 5: Executive Summary

This study was a longitudinal extension of a series of early intervention by means of parent education projects. The purpose was to see if they were lasting effects on school performance and home-school relations as a result of the effort which terminated on the child's third birthday. School records of 91 children, who were found to be representative of the 182 who had been involved at age 2, were examined. Their present teachers filled out rating forms on classroom behavior and their perception of parental involvement. There were three groups of children: those whose families had been involved for two or three consecutive years beginning when the child was either three months or 12 months old (Longitudinal Group) (N=32), those involved for one year (24 to 36 months old) (N=38) and those in a Control Group (N=21). All children had been randomly assigned at entry.

They were significant differences in favor of the treatment groups in that fewer were assigned to special education programs in general and EMR, TMR classes in particular. Less than five percent of the treatment group children were assigned to such classes in the third grade (3 out of 64) while 25% (5 out of 20) of the Control children were so assigned.

There were significant differences in favor of the Longitudinal Group on performance on the MAT, SAT or CTBS in second, third or fourth grade. This group out performed the Controls on MAT scores in Reading ($p = .025$), Math Concepts and Math Problem Solving ($p = .05$) and on a combination of MAT, SAT, CTBS on Total Reading ($p = .05$).

There were no significant differences on teacher ratings. The results indicate that there are clear lasting school achievement and

performance effects for children who were in the parent education program with their parents for two or three consecutive years ending when they were two or three years old. This effect has lasted up to six years after the end of the program.

These results may be viewed as profound and important. The program represented a minimal amount of intervention. The paraprofessional home visitor was recruited from the community and worked on a one-to-one basis with parents at home. The amount of intervention was limited. Homes were scheduled to be visited only once a week, but were in fact visited only approximately two weeks out of three. The time spent in each visit was usually less than an hour. The activities were simple and made use of objects already in the homes. The information conveyed was a demonstration of activities and encouragement to the mother to not only use these during the week but to develop her own. Further, we were developing the program while we were implementing it so that many of the activities were developed, especially in the Home Learning Center program, cooperatively by the staff, the parent educators, and the parents in whose homes these centers were located.

When we began this program in 1966 we raised three questions. First, could a home visit program using paraprofessionals as the key educators be sustained for children from three months of age to three years of age and their mothers? The answer is yes. Second, can materials be developed which can be easily used by the mother and child when demonstrated by professionals? The development and publication of the activities leads to the answer, yes. Third, could such a program make a difference several years later? The results lead to the answer yes.

The project has served as a model for some of the operation of Parent and Child Centers, Parent Child Development Center, Home Start programs, Head Start programs, Home Base programs, Follow Through efforts and programs for special education sponsored by the Bureau of Educationally Handicapped. Although such use began in the late 1960's, there was the continuous question as to its validity. Now we know not only the technology of such programs, but also that our results indicate that such a program can be successful.

The activities developed initially on the Fund for the Advancement of Education funded Parent Education Program (Baby Learning Through Baby Play) and those developed on the NIMH funded Home Learning Center program for children between 24 and 36 months (Child Learning Through Child Play) are widely used in the United States, and have been published in Great Britain, Japan, Italy and Germany.

With emerging concern for cross generational efforts and parenting education programs for high school youth, our program offers a possible model for the involvement of such youth in a program that not only is socially useful in the community but also provides youths with understanding of families and of child development in ways that should impact upon their own roles as parents. It would be rather easy to incorporate the type of home visit program we have developed, with suitable supervision, into a variety of high school efforts in which high school youth are trained as home visitors. It can easily be incorporated into such programs as Exploring Childhood. Further, in the many places in which infant centers are located on school grounds, the activities developed here lend themselves to use in infant and early childhood centers.

Recommendations are made for further research of a longitudinal nature and replication, and for fine-grained analyses of the parent-infant transactional process, including the father. In addition, ecological research questions are raised concerning the role of the family vis-a-vis the society.

Implications are drawn for the education establishment. The results of this study and other studies like it should have an impact on the missions of schools of education and school systems as they come to grips more and more with the need to develop new modes of home-school interaction. The Florida Follow Through Project, which was modeled upon the home visit program, is but one example of the combination of research and in-service needed to find linkages in ways which the school system and the families can supplement each other in assisting the child to reach full development. Federal requirements for the education of handicapped persons also point the way to changes of mission in schools of education and school systems in relating to the parents of very young children. We believe the success of this program offers clues as to one way to proceed. We make no claims that there are not other valuable ways. But we know at least that this one works.

REFERENCES

Bronfenbrenner, U. A report on longitudinal evaluations of preschool programs. Volume II: Is early intervention effective? Department of Health, Education and Welfare, Pub. #(OHD) 74-25, 1974.

Coleman, J. S. Equality of educational opportunity. Washington, D.C.: U.S. Government Printing Office, 1966.

Gordon, I. J. Parent-child transactions and infant competence. University of Florida: Institute for Development of Human Resources. National Institute of Mental Health Grant No. 1 R01 MH/HD 27480-01. Still in progress, begun in 1976.

Gordon, I. J. An investigation into the social roots of competence. Final Report to the National Institute of Mental Health, Project No. 1 R01 MH 22724. Gainesville: Institute for Development of Human Resources, University of Florida, October 1974.

Gordon, I. J. An early intervention project: A longitudinal look. Paper presented at the Merrill-Palmer Conference on Research and Teaching of Infant Development, Detroit, Michigan, February 1973.

Gordon, I. J. Baby learning through baby play: A parent's guide for the first two years. New York: St. Martin's Press, 1970.

Gordon, I. J. A parent education approach to provision of early stimulation for the culturally disadvantaged. A Final Report to the Fund for the Advancement of Education established by the Ford Foundation. Gainesville: Institute for Development of Human Resources, University of Florida, November 1967.

Gordon, I. J. & Guinagh, B. J. A home learning center approach to early stimulation. Final Report to the National Institute of Mental Health, Project No. R01 MH 16037-01. Gainesville: Institute for Development of Human Resources, University of Florida, 1974.

Gordon, I. J. & Jester, R. E. Instructional strategies in infant stimulation. Final Report to the National Institute of Mental Health, Project No. 5 R01 MH 17347-02. Gainesville: Institute for Development of Human Resources, University of Florida, 1972.

Gordon, I. J., Guinagh, B. J. & Jester, R. E. Child learning through child play: Learning activities for two- and three-year-olds. New York: St. Martin's Press, 1972.

Gray, S. W. & Klaus, R. A. The early training project: A seventh year report. Child Development, 1970, 41 (4), 908-924.

Jencks, C. et al. Inequality: A reassessment of the effect of family and schooling in America. New York: Harper & Row Publishers, 1972.

Karnes, M. B., Teska, J. A., Hodgins, A. S. & Badger, E. D. Educational intervention at home by mothers of disadvantaged infants. Child Development, 1970, 41, 925-935.

Levenstein, P. But does it work in homes away from home? Theory Into Practice, June 1972, Vol. XI, No. 3, 157-162.

Levenstein, P. Verbal interaction project: Aiding cognitive growth in disadvantaged preschoolers through the mother-child home program. July 1, 1967 - August 31, 1970. Final Report, ED 059 791, February 1971.

Mayeske, G. W. et al. A study of the achievement of our nation's students. U.S. Department of Health, Education and Welfare, 1973.

Mosteller, F. & Moynihan, D. On equality of educational opportunity. New York: Vintage Books, 1972.

Schaefer, E. S. Major replicated dimension of adjustment and achievement: Cross-cultural cross-sectional and longitudinal research. Paper presented at the American Education Research Association Annual Meeting, Washington, D.C., April 1975.

Schaefer, E. S. et al. Parent-professional-child interaction and involvement second year progress report and proposal for renewal. Mimeographed, Frank Porter Graham Child Development Center, Highway 54 By-Pass West, Chapel Hill, North Carolina, 27514, March 1976.

Schaefer, E. S. et al. Personal correspondence, 1975.

Schaefer, E. S. & Aaronson, M. Classroom behavior inventory, short form, K-12. Pre-standardized copy. 1965.

Siegel, S. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956.

Weikart, D. P., Deloria, D. J., Lawser, S. A. & Weigerink, R. Longitudinal results of the Ypsilanti Perry preschool project, Volume II. Final Report, 1970, High-Scope Educational Research Foundation, ED 044 536, U.S. Office of Education.

Appendix A

Means and Standard Deviations on Four Measures Given at Age 6 by Number of Years and Timing of Participation in the Stimulation Program (N=176)

			Stanford-Binet		Task Oriented Behavior		Preschool Inventory	
Group	Years		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	all 3	26	95.8**	13.3	31.7	4.2	53.5	8.6
2	first 2	11	98.0**	12.7	34.9	9.6	52.4	8.5
3	second 2	8	94.8**	6.7	31.0	2.1	53.3	3.4
4	first & third	9	90.4	10.0	31.6	3.0	48.1	10.3
5	first only	11	91.3	14.4	34.6*	7.2	49.3	11.8
6	second only	13	90.5	13.0	31.3	2.9	48.7	9.1
7	HLC	49	94.8**	12.2	30.9	3.5	51.7	7.2
8	controls	49	89.2	9.8	31.4	2.2	50.6	9.1

**Greater than control at.025 probability level for one-tailed test.

*Greater than control at .05 probability level for one-tailed test.

Appendix B

IQ Scores for Those Not Assigned to Special Education

Longitudinal Group (N=20)

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments & Grade
1.	F	101	107**	92	113	98	106	P[1] in 4, now in 4
2.	F	102	72*	--	60*	60*	63*	R[2] in K, P in 2, now in 3
3.	F	112	74	99	90	94	91	now in 4
4.	F	109	89	101	111	103	103	now in 4
5.	M	123	91	84	103	100	97	now in 3
6.	F	102	78	111	117**	107	106	now in 3
7.	F	111	100**	106	113	100	97	now in 3
8.	F	96	81	73*	86	74*	88	now in 3
9.	M	122	94	94	94	94	105	now in 3
10.	M	96	104**	109	101	98	97	now in 4
11.	F	103	96	111	111	103	91	now in 3
12.	F	114	88	106	105	107	119**	now in 4
13.	M	124	81	--	72*	93	83*	R in 3, now in 3
14.	M	112	79	94	107	105	113**	now in 4
15.	M	100	81	89	113	101	108	now in 3
16.	M	114	83	84	92	84	91	P in 3, now in 3
17.	F	115	80	84	92	103	97	now in 3
18.	F	118	83	--	76*	81*	80*	R in 1, now in 2
19.	F	94	83	92	98	103	86*	now in 4
20.	M	115	96	109	109	103	100	now in 3

* more than one SD below matched data set mean
** more than one SD above mean

[1]P = psychological evaluation
[2]R = retained

Appendix B - Continued

Home Learning Center Group (N=29)

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments & Grade
1.	F	106	66*	92	94	96	94	now in 4
2.	M	--	94	101	101	89	100	now in 3
3.	M	--	82	99	101	92	94	D[3] in 4, now in 4
4.	F	--	84	92	92	96	85	now in 2
5.	M	--	88	99	93	--	--	now in 4
6.	F	--	80	104	98	96	89	now in 3
7.	M	--	88	79*	94	83*	91	P[1] in 2, now in 3
8.	F	--	--	77*	80*	93	82*	now in 4
9.	M	--	--	104	92	100	88	now in 4
10.	F	--	--	99	105	109**	91	now in 4
11.	M	--	72*	99	83*	100	94	now in 4
12.	F	--	92	92	--	105	91	now in 3
13.	F	--	--	89	94	82*	79*	now in 3
14.	M	--	96	111**	105	110**	97	now in 3
15.	F	--	80	99	88	94	94	P in 2, now in 3
16.	F	--	93	104	105	103	114**	now in 3
17.	F	--	90	104	88	91	92	now in 3

(Continued on next page.)

* more than one SD below matched data set mean
** more than one SD above mean

[1]P = psychological evaluation
[2]R = retained
[3]D = referred for disclipine

Appendix B - Continued

Home Learning Center Group (N=29) - Continued

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments & Grade
18.	M	--	106**	101	--	--	113**	now in 3
19.	F	--	100	106	113**	98	91	now in 3
20.	F	--	85	101	107	98	100	now in 3
21.	F	--	84	84*	98	89	94	now in 3
22.	F	--	89	--	86	83*	94	now in 3
23.	F	--	77	78*	76*	89	85	now in 3
24.	F	--	108**	106	109**	100	91	now in 3
25.	F	--	74	84	90	87	102	now in 3
26.	F	--	85	94	101	92	102	now in 3
27.	F	--	86	109	94	100	100	R^2 in 2, now in 2
28.	M	--	109	92	96	92	103	now in 3
29.	F	--	66*	85	84	84	85	R in 2, now in 2

* more than one SD below matched data set mean
** more than one SD above mean

[1]P = psychological evaluation
[2]R = retained

Appendix B - Continued

Control Group (N=13)

Number	Sex	Griffith's at age 1	Bayley at age 2	Stanford-Binet at age 3	Stanford-Binet at age 4	Stanford-Binet at age 5	Stanford-Binet at age 6	Comments & Grade
1.	F	105	110**	89	80	87	88	now in 3
2.	F	99	84	104**	88	103**	85	now in 4
3.	F	104	98	99	109**	112**	100	now in 3
4.	F	106	80	--	85	74	72*	R^2 in 1, now in 2
5.	M	109	89	89	94	87	79*	P^1 in 4, now in 4
6.	F	102	92	101	92	100	77*	now in 4
7.	M	102	88	76*	93	94	85	P in 3, now in 4
8.	M	103	134**	74*	82	92	79*	now in 3
9.	F	102	62*	--	73*	72*	83	now in 3
10.	F	111	100	87	84	83	92	R in 3, now in 3
11.	F	102	81	74*	72*	78*	82	now in 3
12.	M	--	69*	94	86	92	--	now in 3
13.	M	--	92	97	90	91	91	now in 3

* more than one SD below matched data set mean
** more than one SD above mean

[1]P = psychological evaluation
[2]R = retained